

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 5 230 SOUTH DEARBORN ST. CHICAGO, ILLINOIS 60604

REPLY TO ATTENTION OF:

April 30, 1991

Mr. Pat Doyle Peoples Gas Light and Coke Company 122 South Michigan Ave. Chicago, IL 60603

Re: Disapproval of the Work Plan for the Waukegan Coke Plant Site

Dear Mr. Doyle:

This letter constitutes disapproval of the work plan (inclusive of the all plans) for the Waukegan Manufactured gas and Coke Plant Site. I have attached the U.S. Environmental Protection Agency (USEPA) and the Illinois Environmental Protection Agency (IEPA) comments regarding the deficiencies within work plan, field sampling plan, quality assurance project plan and health and safety plans. The administrative order allows 45 days for incorporation of comments.

Please call me if you have any questions.

Sincerely.

Cindy J. Nolan

Remedial Project Manager

cc: Service List
Unit file

R. Hersemann, PRC Eng.

J. Langseth, Barr Eng.

General Comments: Work Plan

1. Page 4-9 discusses why ground water is not a significant human exposure pathway through ingestion. The discussion rationalizes elimination of the pathway for investigation. USEPA cannot "write-off" a useable aquifer. The likelihood or plausibility of aquifer use in the future is an issue for remedy selection by the Regional Administrator. The investigation cannot preempt this decision-making by eliminating the pathway in the investigative phase. Human ingestion of ground watermust remain an exposure pathway.

Also, this discussion needs to include terrestrial exposure to contaminated soil as an environmental exposure pathway.

- 2. Page 5-7 refers to submission of preliminary ARAR and remediation goals after the work plan in approved. This information can and must be submitted with the revised work plan. ARARs and remediation goal identification is an iterative process which must be considered as early in the process as possible.
- 3. Pages 6-3 and 6-25 are missing the ARARS Document submittal in discussion, but it is in the RI/FS schedule. Please add brief discussion to text.
- 4. Page 6-23 references various model for use at this site. Please sumbit the model documentation. USEPA cannot specifically approve use of the models until the site characterization is complete and shows that the models are appropriate for use at this site.
- 5. The tasks within the schedule must be presented in a table form with start, complete and duration dates (along with the existing gantt chart). The RI/FS must show completion within 24 months. The Agency target goals is 18 months. The suggested timeline is too long. The Agency anticipates the risk assessment will require 3 months to complete.
- The work plan and field sampling plan must provide data collection to meet ecological assessment needs in accordance with Risk Assessment Guidance for Superfund Volume Environmental Evaluation Manaual. The exposure pathways to ecological populations must be considered in the conceptual site The ecological risk assessment done by USEPA will mirror the human health assessment including exposure assessment, toxicity assessment and risk characterization. In order to make decisions about the need for environmental toxicity testing in phase II, some preliminary ecological data must be included in phase I. This must include identification of terrestrial and aquatic habitats on and near the site, identification of wetlands and/or floodplains, and common and endangered species. A map(s) developed for the site must note ecological features. In addition, the results of phase I should provide a preliminary contaminant mass loading to the Upper Harbor and Lake Michigan and preliminary exposure point concentrations.

DRAFT WORK PLAN COMMENTS

PRC reviewed the draft work plan, dated January 23, 1991, for the Waukegan Manufactured Gas and Coke Plant site in Waukegan, Illinois, for consistency with U.S. EPA's Guidance on Remedial Investigations and Feasibility Studies Under CERCLA (October 1988) and for general technical content and investigative approach. PRC's comments on the work plan are provided below.

- 1. Page 1-3, Section 1.3: The areal extent of soil contamination should not be defined by visual field observations alone. Visual observation will provide a qualitative estimate of the contamination only. Soil sampling and analysis will be necessary to define the nature and extent of contamination. All activities to be performed in Phase I should appear in this introduction.
- 2. Page 1-3, Section 1.3: The last sentence mentions identifying and characterizing source areas. If this is an additional objective of the RI, it should be stated in Section 1.2.
- 3. Page 2-5, Section 2.3.2: The text states that several pits and sumps were filled in with noncombustible ruble. These pits and sumps should be identified during the RI because they can act as continuing sources of contamination to the ground water and areas of preferred surface water infiltration.
- 4. Page 2-7, Section 2.3.4: Although processing, storage, and disposal activities were within the property boundaries, the possibility of contaminant migration outside these boundaries should be addressed. It may be premature to define site boundaries as being the same as property boundaries. The National Contingency Plan (NCP) defines the site as all areas of contamination related to a facility whether on or off the facilities property boundaries.
- 5. Page 2-10, Section 2.4.3: The text states that Illinois Environmental Protection Agency (IEPA) was contacted for information regarding sample collection. Section 3.5 mentions ten soil samples collected by IEPA, but Figure 2.4-1 shows only eight sampling locations. This discrepancy should be resolved.
- 6. Page 3-7, Section 3.3.1, Paragraph 1: The first sentence should include the word "a" between "is" and "gray."
- 7. Page 3-8, Section 3.3.2: This section would be more coherent if the order of the two paragraphs was switched. The section should begin with broad statements about regional flow before site studies are discussed. In addition, a sentence should be added to what is currently the first paragraph that states, "site and near-site hydrogeologic investigations are discussed in more detail below."
- 8. Page 3-11, Section 3.4.1: Average or maximum polyaromatic hydrocarbons (PAH) and phenol values should be specified in the text as well as referenced in Appendix A.
- 9. Page 3-11, Section 3.4.2: The text states that there are no surface water bodies on the WCP site. As previously noted, the term "site" is defined in CERCLA as "facility" (Section 101(9)) including "any site or area where hazardous substances have been stored, disposed of, or place, or otherwise come to be located;..." This definition indicates that both Lake Michigan and the Waukegan Harbor are to be considered part of the WCP site.
- 10. Page 4-2, Section 4.3: This section should clearly define the purpose behind establishing potential contaminants of concern. It is appropriate to identify potential contaminants to establish a conceptual site model to support the rationale for additional sampling and

analysis. However, it is inappropriate at this point in the RI to establish a very focussed list of contaminants to be analyzed.

- 11. Page 4-9: Last exposure pathway listed. The last exposure pathway should be divided into two separate pathways: (1) direct contact with soil and (2) inhalation of releases to ambient air.
- 12. Page 4-11, Section 4.6.1: This paragraph refers to a coal tar plant. It should refer to the manufactured gas and coke plant and the railroad tie and wood treating plant.
- 13. Page 4-12, Paragraph 1: Characterizations of surface water quality and sediment quality should be included as data gaps.
- 14. Page 6-3, Section 6.3: The paragraph at the bottom of the page discusses Phase II in the Phase I section. This paragraph should be moved to the beginning of Section 6.4 on page 6-11 or the two paragraphs should be included in an introduction section and Phase I start with 6.3.1.
- 15. Page 6-3, Paragraph 1: Sampling activities in Phase I should be expanded to include more full scan analyses of soil samples. The scope of Phase I should be broader so that the areal extent of contamination can be more clearly defined. It may be possible to install more than three pairs of monitoring wells in Phase I based information from other Phase I activities. Surface water and sediment sampling may be of concern at the site but have not been addressed in the work plan. Please provide.
- 16. Page 6-5, Paragraph 2: Test trenches should also be included for the railroad tie and wood treating plant because this is an identified source of contamination.
- 17. Page 6-5, Figure 6.3-1: Trenching near the wood treatment area should be considered. Very little soil characterization is proposed for the entire western side of the site.
- 18. Page 6-6, Section 6.3.3: Background soil samples should also be analyzed for total organic carbon (TOC). It is important to determine this parameter in undisturbed and uncontaminated portions of the site to accurately determine the fate and transport of contamination. Also background soil samples should also be collected from each stratigraphic unit which contaminant transport is likely. The results of the analysis from samples collected 0 to 3 feet below land surface (BLS) will not be adequate to define conditions deeper in the soil column.
- 19. Page 6-7, Section 6.3.4: Surficial soil sampling as proposed requires one composited sample for every 6 acres. This is inadequate to characterize the surficial soil and should be reconsidered.
- 20. Page 6-8, Paragraph 1: Split spoon samples should be collected at the till-sand interface to determine whether contamination has penetrated into the till.
- 21. Page 6-8, Paragraph 4: The text should clarify whether laboratory analysis be based on visual inspection alone or whether headspace measurements will also be a deciding factor. A more detailed method of soil sample headspace screening is established in SW-846 and should be followed.

Also, no provisions are made for the collection of samples for grain size distribution, Atterberg limits, TOC, or vertical permeability in Phase I. Please provide the rationale for waiting until Phase II for this information.

- 22. Page 6-8, Paragraph 4: Visually observed contamination should not be the determining factor for collecting soil samples. Soil samples should also be collected where changes in stratigraphy occur.
- 23. Page 6-9, Paragraph 2: The rationale behind monitoring well placement should be expanded upon. MW-3S and MW-3D are on the expected divide. It is unclear as to exactly what these wells are downgradient of. Also, the rationale for using different screen lengths for shallow and deep wells should be described.
- 24. Page 6-10, Section 6.3.5.5: Slug test details and procedures should be referenced to Section 3.10 in the field sampling plan.
- 25. Page 6-12, Section 6.4: Many of the objectives listed for the phase two investigation can be incorporated into the Phase I investigation. These include characterizing the site geology, evaluating the hydraulic characteristics of the sand unit, characterizing the ground-water flow regime, characterizing the geotechnical properties of the till and sand unit, and providing data to evaluate the need for potential treatment technologies. Phase I of the investigation can be expanded to include these earlier in the RI. Although this will increase the scope of the Phase I investigation it will allow the scope of subsequent phases of investigations to be much more refined than currently proposed.
- 26. Page 6-12: A main objective of the Phase II investigation should be to address any data gaps identified during Phase I work. Data gaps may exist for site characterization, contaminant characterization, fate and transport information, and risk assessment data collection.
- 27. Page 6-13, Section 6.4.2.1: The rationale used to site Phase II soil borings is inadequate. Siting boring on the results of either the surface soil investigation or the test pit data alone seems to overlook the data collected in new slip boring program. This investigation indicated that phenol contamination was generally absent above the water table (0 to 5 feet below land surface (BLS)). But present at very high concentrations below 15 feet BLS.
- 28. Page 6-15, Paragraph 1: Soil sampling objectives should also address any contamination in the till. As proposed, the objectives assume that only the sand is contaminated.
- 29. Page 6-17, First full paragraph: The volatile organic compound (VOC) collection procedure should be clarified further. Total VOCs will be analyzed for using headspace analysis, but only (BETX) will be analyzed for by a laboratory. This procedure may be insufficient to identify individual contaminants present in the soil.
- 30. Page 6-18, Section 6.4.2.2: Samples collected for TOC should be collected from background areas in addition to "on-site" locations. TOC samples should be collected to represent each unit in which contaminant transport is likely.
- Page 6-21, Section 6.4.3.4: The duration of the pumping test seems short. Typically pumping tests are conducted over 48 to 72 hours. The justification of the 24-hour pumping test duration should be provided. It is also possible that the pumped water may be contaminated. The RI work plan should propose a method for the safe disposition of this water.
- 32. Page 6-22, Section 6.4.4.2: Surface water sampling should be proposed for Phase I because surface water is a receptor in the Conceptual Site Model. Sediment sampling should also be proposed for Phase I.

- Page 6-23, Section 6.5: A third party independent data validation is normally required to be conducted. This data validation should be conducted in accordance with EPA function guidelines for the validation of inorganic (and organic) analyses.
- Page 6-27, Section 6.12.2: Additional information concerning the computerized database should be forwarded to EPA. This information should include the type of database, file structure, and any other information pertinent to data management.

General Comments: Field Sampling Plan

1. Background samples

Background samples are heavily influenced by indutrial use with similar waste streams and are therefore unacceptable. Appropriate background for representation of the same soil type and strata may be at the water works property if historical land use shows locations not affected by contaminants from the Coke Plant Site (CPS) or other similar historical industrial operations. See related future land use discussion in the NCP at 8710. The baseline risk assessment will look at a future land use that is both reasonable, from land use development patterns, and may be associated with the highest risk, in order to be protective. Background sample locations must be selected with this mandate in mind.

Five sample locations will be adequate for risk assessment purposes, but they must be full chemcial scan. Table 3.1.-1 must reflect this.

2. Surficial soil sampling and test treching

The stated objective of surficial soil sampling is to assess the need for non-manufactured gas /coking plant and non-creosoting soils investigations during phase II. The approach of taking one composite sample in 6 acres will not achieve the objective. The work plan and field sampling plan must provide a defensible rationale for grid and sample size. In addition, it must discuss how the data will be used to develop phase II data activites.

The proposed "grid" does not account for current physical barriers such as the new slip and does not account for previous property boundary located at the south end of the site, or obvious differences in historic or current property use in the compositing. Composite samples on anything other than a tight grid system may dilute concentrations and mask potential problem areas and are not acceptable.

The number of soil sampling locations must be increased to adequately characterize the nature and extent of contamination at the site. This can be done be establishing a grid system based on the estimated size of hot spots to be identified or by superimposing a mini-grid system for each known or potential hot spot and for a phase I effort, allowing field screening techniques to dictate sample density for the hot spot areas. By developing a defensible grid size, along with the trenching activities, known and potential source areas can be investigated in more detail in Phase I.

The EPA guidance document, Methods for Evaluating the attainment of Clean-up Standards -- Volume 1: Soils and Solid Media, dated February 1989 describes such methods. Other references are also

available, such as Soil Sampling Quality Assurance User's Guide, dated March 1989. Using the first guidance as an example, if one were assume the entire site was comprised of large hot spots (northwest pond and tie plant), medium hot spots (sulfur pond and north pond), or small hot spots (tanks and sumps), site-wide grid size could be established to ensure that a hot spot of a selected size would not be missed. The grid spacing for large hot spots would be 328 feet (13 samples), for medium hot spots, the grid spacing would be 141 feet (69 samples) and for small hot spots, a grid spacing of 36 feet (1,059) samples would be needed.

The work plan is oriented toward identification of the coal tar areas and certain smaller waste streats, such as the thylox areas. The focus in phase I for viaual identification does not support characterization of the site in areas which are not visually obvious. Inorgainc compounds are generally ignored when in fact most are contaminants of concern. A grid size of 141 feet in phase I with discrete analysis for BETX, PAH and Metals along with trenching would be adequate to focus phase II sampling efforts. As a practical matter, this grid spacing would need to work around the existing physical constraints, such as the new slip and the waste pile.

The proposed sampling plan uses a 200 foot grid (24 samples), but inappropriately excludes the south strip of land. A 200 foot grid over the site results in 36 samples.

The sampling and analysis plan also does not account for characterizing the following:

The coal layer. This results from the storage of raw materials on the site. The thickness varies considerably over the site and may extend north of Sea Horse Drive. This material must be adequately chemically characterized, as well as evaluating its leachate characteristics.

The ponds and off-site surface drainage areas. The pond areas were likely used for contact cooling water and/or site run-off. Likewise, the surface drainage area which flowed off-site to Lake Michigan at the southeast corner of the site.

The wood treating creosote area. The workplan does not provide sampling or analysis of this area.

More sampling in phase I is appropriate since phase II should be used to fill data gaps and define the vertical extent of contamination, as suggested by the work plan. Test trenches are used for identification of subsurface feasures and preliminary sampling for BETX and PAH indicators. The test trenches become more significant a method of preliminary characterization for the smaller potential hot spot area such as sumps and tanks. A minimum of one sample per trench must be specified with flexibility to sample more if field observations warrent. Other indicator parameters must also be included (i.e., sulfur near the sulfur ponds).

3. Ground water monitoring

The objective stated in the field sampling plan states the objective of the monitoring wells and piezometers in Phase I is to make a preliminary characterization of ground water quality and flow directions. The plan need to provide a rationale for how the suggested locations will meet this objective. It further states that the Phase I monitoring wells are positioned to act as downgradient monitoring points. This is not well supported by available site information. No monitoring wells have been proposed immediately downgradient of the wood treating plant, the OMC tank storage area, or the pond areas. In addition, existing monitoring well nests MW-1 and MW-2 have been decommissioned.

As noted above, some additional perimeter monitoring well location can be identified now. These would be needed to characterize off-site contaminant migration in all directions. With a shallow water table and sandy soils, this site is conducive to use of temporary sand-point in phase I and, in conjunction with hot spot delineation, would better support the phase II monitoring well network. In addition, The plans discuss the influence to the local groundwater as a result of the new slip. Additional ground water monitoring wells should be focused in the area to see what actual relationship it may have to the manufactured gas, coking operations and ground water. In addition, which hollow-stem auger drilling techniques need to be defined.

Additional, more detailed comments are attached.

FIELD SAMPLING PLAN (FSP) COMMENTS

PRC reviewed the FSP, dated January 23, 1991, for the Waukegan Manufactured Gas and Coke Plant site in Waukegan, Illinois, and for general technical content and investigative approach. PRC's comments on the FSP are provided below.

- 1. Page 3-2, Paragraph 1: Soil samples for TOC analysis should be collected from background locations. If proposed background locations are comprised of fill or other non-native material, these locations will have to be revised.
- 2. Page 3-3, Paragraph 5: Surficial soil sampling as proposed requires one sample for every 6 acres. This is inadequate to characterize the surficial soil and should be reconsidered.
- 3. Page 3-4, Section 3.2.3: The text should clarify why background samples will be collected with hand equipment but site samples will be collected with a backhoe. The procedure for compositing samples from four locations in one area with the backhoe should be clarified.
- 4. Page 3-6, Paragraph 1: Test trenches should also be included for the railroad tie and wood treating plant because this is a source of contamination.
- 5. Page 3-8, Paragraph 1: The text should clarify why only two samples will be analyzed for the entire target analyte list/target compound list (TAL/TCL) scan. More thorough analysis of surface soils should be conducted in Phase I. Phase II analysis might then be cut back based on Phase I results.
- 6. Page 3-10, Section 3.5.3: The third sentence does not make sense.
- 7. Page 3-11, First full paragraph: A decontamination area for cleaning equipment should be constructed to collect rinse water. Allowing rinse water to be dumped on the ground is unacceptable.
- 8. Page 3-11, Paragraph 2: It is recommended that a decontamination area is designated for all decontamination of equipment rather than cleaning at each borehole location.
- 9. Page 3-12, Section 3.6.1: The text should clarify whether samples will be sent for lab analysis based on visual observations alone or whether field measurements (headspace analysis) will be done as well.
- 10. Page 3-14, Last paragraph: The well locations stated do not match Figure 3.5-1. This discrepancy should be resolved.
- 11. Page 3-16, Paragraph 2: Well construction should include a bentonite seal between the grout and the sand pack. Fine sand can be used between the bentonite seal and the sand pack. Also, the concrete may need to be deeper than 3 feet below the ground surface to ensure that it goes beneath the frost line.
- 12. Page 3-17, Paragraph 1: Jetting should be avoided so that water is not introduced into the formation. Development can be achieved by pumping, loading, and surging with the well.
- 13. Page 3-17, Paragraph 3: A minimum of three well volumes until stabilization occurs should be required for well development. The work plan states that ten well volumes is the minimum removed which may be excessive if stabilization occurs prior to ten volumes. This may result in generating an unnecessary volume of contaminated water.

- 14. Page 3-17, Paragraph 3: Purge water should be collected and properly disposed of.
- 15. Page 3-20, Paragraph 6: Purge water should be collected and properly disposed of.
- 16. Page 3-20, Section 3.9.4.1: Total well depth will be known from well logs. Water levels should be measured before sample collection so that the volume of water to be purged can be determined.
- 17. Page 3-20, Paragraph 6: Purge water should be collected and properly disposed of.
- 18. Page 3-22, Section 3: Sampling of sediment and surface water should be proposed for Phase I because they are identified as receptors in the Conceptual Site Model. If they are not intended to be sampled, the rationale for this decision should be provided.
- 19. Page 3-22, Last paragraph: The slug test procedure describes rising head tests only. Falling head tests should be addressed as well. Both rising and falling head tests should be conducted.
- 20. Page 4-11, Paragraph 1: Purge water should be collected and properly disposed of.
- 21. Page 4-14, Paragraph 5: Purge water should be collected and properly disposed of.
- 22. Table 3.1-1: The table should note that the six surface soil samples will be analyzed for the full scan except volatile organic analytes (VOAs).
- 23. VOA Sample Collection: Preservation of VOA samples should be based on lowering the pH below 2. At present, it is based on a number of drops of preservative added to the sample.

TEPA

ADMINISTRATIVE PROCEDURE #15 LABORATORY DETERMINATION OF PERMEABILTY OF FINE GRAINED SOILS

Title:

Purpose:

To identify requirements for and standardize the determination of the laboratory permeability of fine grained (greater than 10% passing the #200 sieve) soils. Various methods and procedures are currently available and used to determine soil permeability. Results vary greatly depending on the method and procedure used to determine soil permeability. In order to ensure consistency in the determination of the permeability of soil to be used for liners or covers for waste management units (RCRA, solid waste, CERCLA, etc.) the following procedures have been developed. NOTE: If compatibility of soil with the permeant is in question, other tests must be performed.

Procedure

Laboratory determination of permeability of fine grained soils shall be performed using the modified triaxial apparatus technique, including back pressure saturation, to determine the constant head, saturated permeability of an "undisturbed" soil sample. Disturbance of the soil sample shall be minimized both before, and during the determination in order to approximate actual field conditions. The determination shall continue wintil permeant liquid inflow and outflow are equal and until a "steady-state" permeability value is obtained. At a minimum, the determination shall continue until at least one-quarter (1/4) pore volume of permeant liquid have passed through one soil sample or the volume of permeant flowing out of the sample in a minimum period of six hours is equal to the volume input in the same period, whichever is longer. The permeant liquid shall be (1) either tap water or 0.005 N CaSO. solution for covers or (2) a 0.005 N CaSO. solution or leachate from the site or another site with similar physical and chemical characteristics for liners. In any case, distilled water shall not be used. The effective stress (confining cell pressure minus the average of the headwater and tailwater pressures) applied to the soil sample in the triaxial apparatus shall be set as close as possible to the expected in situ-stress conditions to prevent excessive consolidation of the soil sample. Hydraulic gradients (driving force pressure expressed in centimeters of water pressure divided by the length of sample in centimeters) used for a determination shall be kept below 30. Sample size must have a minimum ratio of diameter versus height of 1 to 1 with a minimum diameter of 2.75 inches. Laboratory permeability determination results shall include a detailed description of both the sample collection and preparation techniques and the details (cell pressure, headwater pressure, tailwater pressure, driving pressure, gradient, sample size, permeant liquid, time, etc.) of the determination procedures.

Programs Affected: Permits, RPMS, Compliance, FOS

Hritten By: G. Tod Rowe, June 4, 1990

IEPA

ADMINISTRATIVE PROCEDURE # 11

TITLE:

Monitor Well Design Criteria

PURPOSE:

To ensure consistency and integrity of groundwater samples.

DISCUSSION:

Monitor wells must meet the following three objectives:

- 1. Must be able to collect a groundwater sample.
- 2. The water sample collected must be representative of the water quality.
- 3. The well must be constructed to create a minimal disturbance of the water quality.

PROCEDURE:

I. Monitor Well Casing

- A. Casing must be clean, free of rust, grease, oil or contaminants and composed of materials that will have the least effect on the quality of the water sample. If volatile organic sampling is required, the well casing and screen in the saturated zone must be made from stainless steel, type 316 or 304. If PVC is used, it must be certified by the National Sanitation Foundation (NSF).
- B. Must have a minimum inside diameter of two inches (2") and not more than four inches (4"). A 2"-4" diameter is preferred because the larger the well volume, the more water must be evacuated to obtain a representative sample.
- C. The joints must be flush threaded and watertight. No adhesives, solvents or grease shall be used. Where casing of dissimilar metals are joined, a dielectric bushing must be used to prevent a galvanic reaction.
- D. Casing must be strong and hold up to pressures from surrounding materials and be corrosive resistant to the water or materials it comes in contact with.
- E. The well casing must be straight and free of any obstruction.
 - F. All wells must be vented so that the pressure in the casing is equal to atmospheric pressure.

II. Monitor Well Screens

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- A. The well screen must meet all of the above criteria for monitor well casing.
- B. The slot size must be compatible with the grain size of the annular filter pack and the surrounding in situ material.
- C. Screens must be continuous slot wire wound or machine cut. Field slotted is unacceptable. A filter cloth or sock around the screen is not recommended. It may inhibit well development, in situ field permeability and may, over time, clog the well.

III. Annular Fill Material

- A. The filter pack around the screen should filter out sediments and be 2½ 3 times larger than the 50% grain size of the zone being monitored.
- B. A clean, well rounded and uniform (mainly one grain size) filter pack is preferred; however, in sand and gravel deposits where cave-in occurs, the natural sand and gravel is acceptable.
- C. To ensure that the sealing material does not interfere with the screen, the filter pack shall, at a minimum. extend one to two feet above the top of the well screen.
- D. The sealing material above the filter pack must prevent the migration of fluids from the surface and between subsurface units. The sealing material must be installed from the bottom of the annular opening upward in one continuous operation using a "tremie tube" or "tremie pipe". No quick setting cements that contain additives will be allowed. Any bentonite used must also be free of additives. The well seal material shall be chemically compatible with the anticipated waste.
- E. At the surface, a concrete cap sloping away from the well shall be installed. To prevent frost-heave damage, the cap shall extend below the frost zone.

IV. Monitor Well Protection and Identification

- A. Wells must be protected from vandalism with a locking cover.
- 8. Wells must be identified by a monitor point number. See attached Agency procedures for designating monitor point numbers.

- C. The location of the well must include county, site name, township, range, section, and the well must be located on a topographic map (scale 1" = 200' or larger).
- D. The wells identification number shall be clearly and permanently marked on the outside of the protective cover.

V. Other

- A. Monitor wells shall be constructed only by a licensed water well driller under the Illinois Water Well and Pump Installation Contractor's License Act (Ill. Rev. Stat. 1985 ch. 111, par. 7101 et seq.)
- B. All water used in the drilling, cleaning, and construction process shall be obtained from a source that is free of contaminants and will not result in the contamination of the monitor well or the groundwater.

PROGRAMS AFFECTED:

Permits
Compliance
FOS

RPMS

WRITTEN BY:

Sherrilyn Otto July 14, 1989

SMO:tk:1/9/12(Revised 9/5/89)

If a facility has 105 monitor wells, the first 99 would be numbered G101-G199. Monitor wells 100-105 would be numbered G1A0-G1A5.

If 215 soil samples or waste samples are collected from a site, numbering would be as follows:

First 99 soil samples - X101 - X199
First 99 waste samples - X201 - X299
Soil samples 100-109 - X1A0 - X1A9
Soil samples 210-215 - X1L0 - X1L5
Haste samples 100-109 - X2A0 - X2A9
Haste samples 210-215 - X2L0 - X2L5

5. Numbering of Replacement Groundwater Monitoring Points

When a facility replaces a groundwater monitoring point because the existing point has been damaged, destroyed, found to be continually dry or otherwise rendered such that a sample cannot be collected, a new monitor point number needs to be assigned to the replacement point. Note that a replacement point is one that is located in the same general area and generally monitors the same hydrogeologic zone as the point it is replacing.

In order to distinguish the new point as a replacement point, the letter 'R', 'A', 'B', 'C', etc. is to be used as the first character of the four character monitor point number. The last three digits are to be the same as the old monitor point number.

The letter 'R' is used if it is the first replacement point.

Example:

Damanged Hell Monitor Pt. No. New Hell Monitor Pt. No.

G101

R101

If the 'R' well becomes damaged or needs to be replaced, then the new monitor point number is to begin with the letter 'A'.

Example:

Damanged Hell Monitor Pt. No.

New Hell Monitor Pt. No.

R101

A101

If the 'A' well becomes damaged, the replacement well number will begin with the letter 'B'; and if the 'B' well becomes damaged, the replacement well number will begin with the letter 'C'.

Following the above procedure allows for four replacement wells at a monitor point location. If the situation arises where a fifth, sixth, etc. etc. replacement well is needed, this same procedure can be continued by using additional letters. However, you must be careful not to use a letter that has been assigned to some other meaning (i.e., S = surface water, L = leachate, X = special, P = piezometer).

6. Adding a new well to existing wells

When a new well is added to currently existing wells, and the background information is basically the same for the new well, it should follow the normal numbering sequence. This would apply to a new well that is added where the facility relied on the same set of consistant geologic information. The facility would be adding one or two wells to expand their current program. In the computer database, the groundwater data for the new well would be grouped with the data for the old series. For example:

OLD SERIES

NEW HELL DESIGNATION

G101, G102, G103 R121, G122, G123 G104 G124

7. Adding a new series of wells

Hhen a new series of wells are added and the facility used a new study to determine the geology of the site, groundwater flows, location of wells, etc., the new series should be designated with a factor of ten increase using the same numerical sequence. Hithin the computer, the groundwater data would be grouped into a separate category. For example:

OLD SERIES	NEN HELL DESIGNATION
G101, G102, G103	G114, G116
R105, A106, G107	G118, G119, G120, G121
G125, G126, G127	G138

If there is a series of ten wells and a new well is being added, and the numbering is increasing through a normal sequence, just continue the numbering. This should not cause any problems to the above scenerio.

8. Plezometer wells

when a new well is designated as a piezometer and used mainly for field measurements, it should be numbered in the "P" series. For example: P101, P102, P103, P104, P105, etc.

when an existing monitoring well is no longer in service to monitor constituents, and is used as a piezometer for field measurements, and is used as a piezometer for field measurements, and is used as a piezometer for field measurements, and is used as a piezometer for field measurements. It must maintain the same numerical designations. For example:

OLD WELL	NEH HELL
G105	P105
G110	P110
R115	P115
L105	P105

The only caution when using the "P" series, is when you are replacing wells using the "R", "A", "B", "C" sequence, you should now no longer use the "P" series as a replacement well number.

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PROCEDURES FOR ASSIGNING AGENCY DESIGNATED MONITOR POINT NUMBERS

The monitor point number identifies a specific monitor point where samples are taken. The first digit must only be an alpha character. The second digit must only be a numeric character, except nested wells which may use alpha characters. The third and fourth digits may be any alpha or numeric value. The following guidelines should assist in assigning monitor point numbers for the majority of situations.

1. The first two digits identify the type of the monitoring point. The following key provides the appropriate first two digits of the monitor point number.

Key for Determining Type of Monitoring Point

G Groundwater	<u>L Leachate</u>	S Surface Hater	X Special
1 or Alpha* = Monitor Hell	1-Flow or Seep	1-Upstream	1=5011
2=Private Hell**	2-Pond	2-M14-51 te	2=Haste
3=Spring	3-Collection	3-Counstream	3-Other
4-Lysimeter	System (riser, sump, etc.)	4-Run-off	
5-Public Hater Supply		5=Impounded	
6=Recovery Hell		6=Run-on	
7=Injection Hell	2 Pania	rement P Plezometer	

Replacement P Plezometer

Beinterceptor Trench See Item 5 See Item 8

9-T111 Hell***

Note *: The "Alpha" characters are to be used in only nested well situations. See discussion in item 3.

Note **: If a private well is to be used as a routine monitoring point for the required monitoring program, the G1 rather than the G2 coding is to be used. G2 is to be reserved for private wells sampled for private well inventories or other private wells which are not part of the required monitoring program.

Note ***: The "9" code is to be used only in special cases. Example: If a RCRA/HM Subpart F site has wells which monitor the groundwater in the glacial till, the "9" code may be used to distinguish these wells from the aquifer wells.

....

- The last two digits are a sequential numbering of the monitoring point type.
- 3. For situations where there are nested groundwater monitoring points, each point in the nest must be numbered. The first character is to be the letter \underline{G} indicating groundwater.

The second and third digits are the numbering of the nested locations.

Note that if you have a nested location number 20..., 30..., or 40... etc., confusion may be caused because those beginning digits signify a particular groundwater monitoring type (i.e., 2 = private well, 3 = spring, etc.). Therefore, should this situation arise, use the following conversion:

Conversion	<u>Example</u>
A = 20's	. A4 - 24
B = 30's	86 - 36
C = 40's	C3 = 43
D = 50's	07 - 57
E = 60's	€9 € 69
F = 70's	F2 - 72
G = 80's	GS - 85
H - 90's	H8 - 98

The fourth character of the monitor point number is to be: S = Shallow. U = Upper Middle, N = Middle, L = Lower Middle, D = Deep.

Therefore, if you have a nest made of:

two wells, you will have	S = Shallow D = Deep
three wells, you will have	S = Shallow M = Middle D = Deep
<u>four weils</u> , you will have	S = Shallow U = Upper Middle L = Lower Middle D = Deep
<u>five wells</u> , you will have	S = Shallow U = Upper Middle M = Middle L = Lower Middle D = Deep

Example: For a facility with four nested locations (one shallow and one deep at each location) which the facility has numbered #7, #14, #26 and #32, the Agency designation would be as follows:

licant Designation	Agency Designation
# 7 shallow	G07S
# 7 deep	G07D
#14 shallow	G14S
#14 deep	G14D
#26 shallow	GA6S
#26 deep	GA6D .
#32 shallow	G82S
#32 deep	G82D

4. Situations with more than 99 sampling points.

If the situation arises where there are more than 99 sampling points (i.e., more than 99 monitor wells or soil samples or waste samples, etc.) the following conversion is to be used.

Conversion	Example
A = 100's	A3 - 103
B = 110's	84 - 114
C = 120's	C2 - 122
D = 130's	01 - 131
E - 140's	ES - 145
F = 150's	F9 - 159
G = 160's	GO - 160
H - 170's	H1 = 171
I - 180's	17 - 187
J = 190's	J9 - 199
K - 200's	K2 = 202
L = 210's	LS - 215
M = 220's	M6 - 226
N = 230's	N3 - 233
0 = 240's	20 - 240
P - 250's	₱1 = 251
Q = 260's	05 - 265
Ř = 270's	Ř7 = 277
S =-280's	\$9 - 289
T - 290's	T6 - 296
U = 300's	U7 = 307
V = 310's	V8 = 318
H = 320's	H1 - 321
X = 340's	x5 - 345
Y = 350's	Y7 - 357
2 = 360's	Z2 - 362

ADMINISTRATIVE PROCEDURE # 14

Title:

Soil Yolatile Sampling Procedures

Purpose:

To identify requirements for and standardise the soil sampling procedures used to determine if Agency set clean-up objectives have been met. Results vary depending on the sampling method and procedure used to take the soil samples. In order to ensure consistency in the soil sampling procedures used when volatile constituents are in question at clean-ups (RCRA, Voluntary, SRAPL, NPL, etc.) the following procedures have been developed.

Procedure:

- PREPARATION AND DECONTAMINATION OF STAINLESS STEEL SOIL SAMPLER
 - *1. Wash tubing or sampler with hot water and a nonfoaming determent.
 - 2. Ringe with hot water.
 - *3. Rinse with a pesticide grade solvent, such as hexane.
 - 4. Rinse with very hot water to drive off solvent.
 - 5. Rinse with deionized water.
 - 6. Store the sampler in aluminum foil until ready for use.
 - *Consult the laboratory for specific recommendations.
- SOIL SAMPLING FOR VOLATILE ORGANICS
 - 1. Using a properly decontaminated and stored stainless steel sampler (refer to preparation and decontamination instructions), take a core sample of soil.
 - 2. Add additional clay to the ends of the sample, if necessary, to eliminate head space. DO NOT remove sample from sample tube in the field. The laboratory should remove the sample from the sampling tube.
 - 3. Cover both ends of the sampler with aluminum foil. Cover the aluminum foil with a plastic cap, such as a thread protector.
 - 4. Put the sample on ics immediately.
 - 5. Transport the samples to the laboratory as soon as possible. Most laboratories require delivery within 24

hours of sampling.

NOTE: Soil samples which will be tested for volatile organic constituents <u>cannot</u> be composited because of the volatilization which would result from any compositing method.

Programs Affected: - Permit Section

- Field Operations Section

- Remedial Project Management Section

- Compliance Section

written By: G. Tod Rove January 30, 1990



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY 81.00-6

NOV | 3 1986

OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE

MEMORANDUM

SUBJECT RCRA Regulatory Status of Contaminated Ground Water

FROM: Marcia E. Williams, Director Milliams, Williams

Office of Solid Waste

TO: Patrick Tobin, Director
Waste Management Division, Region IV

This is in response to your memorandum of September 18,: 1986, regarding the regulatory status of ground water contaminated with hazardous waste leachate. To answer this question, one first has to determine the status of ground water. Under the regulations, ground water contained in the aquifer is not considered a solid waste, since it is not "discarded" in the sense of being abandoned, recycled, or inherently waste-like as those terms are defined in the regulations. See 40 CFR 261.2(a)-(d). Therefore, contaminated ground water cannot be considered a hazardous waste via the mixture rule (i.e., to have a hazardous waste mixture, a hazardous waste must be mixed with a solid waste; see 40 CFR 261.3(a)(2)(iv)). Nevertheless, ground water contaminated with hazardous waste leachate is still subject to regulation since it contains a hazardous waste. Therefore, the treatment, storage, or disposal of ground water contaminated with hazardous waste leachate must be handled as if the ground water itself were hazardous since hazardous waste leachate is subject to regulation under Subtitle C of RCRA. However, if the ground water is treated such that it no longer contains a hazardous waste, the ground water would no longer be subject to regulation under Subtitle C of RCRA.

^{1/} This memo more precisely explains the position on ground water contamination presented in John Skinner's memo dated December 26, 1984.

Taking this interpretation and applying it to the example in your memorandum, the ground water containing a listed hazardous waste, once collected, is subject to regulation under the hazardous waste regulations. However, if as a result of treatment, the ground water no longer contains the hazardous waste leachate, the ground water would no longer be subject to the hazardous waste rules.

Your letter also raises the question of treatment of ground water within the context of corrective action. If the corrective action is taken at an interim status facility in compliance with a \$3008(h) order, treatment can take place. We are considering the possibility of amending the regulations to clarify the relationship between corrective action and the reconstruction ban (\$270.72(e)). More broadly, the Agency is currently examining the issue of whether permits should be required for any corrective actions. We are also developing rules for corrective action under RCRA \$3004(u). Until this analysis is completed, if the corrective action takes place at a permitted facility, it can be handled as a permit modification.

Please feel free to call Matt Straus, of my staff, if you have any further questions; his telephone number is 475-8551 (FTS).

cc: Hazardous Waste Division Directors,
Regions I-III and V-X
Gene Lucero, OWPE
Lloyd Guerci, OWPE
Mark Greenwood, OGC
Steve Silverman, OGC



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION 5 230 SOUTH DEARBORN ST. CHICAGO, ILLINOIS 60604

Pac d 2/25/9/

REPLY TO ATTENTION OF:

5SMQA

MEMORANDUM

DATE: FEB 2.1 1991

SUBJECT: Review of Initial Draft Quality Assurance Project Plan

(QAPjP) for the Remedial Investigation/Feasibility Study (RI/FS) at Waukegan Manufacturing Gas and Coke

Plant Site, Waukegan, Illinois.

FROM: George C. Schupp, Chief

Quality Assurance Section

TO: James Mayka, Chief

Illinois/Indiana Section

ATTENTION: Cindy Nolan, RPM

We have completed our review of the subject initial draft QAPjP (QAS Log-In # 1454) received on February 6, 1991. The present QAPjP is not approvable since it contains numerous deficiencies which are detailed in this memorandum.

Our comments are as follows:

I. QUALITY ASSURANCE PROJECT PLAN

A) Title Page

There are two approval signature spaces for the U.S. EPA Region V Project Manager. Delete one of these signature spaces.

B) Project Description

1) Section 3.1: There should be a brief explanation in the introduction describing the two phases of this project and stating the rationale behind this approach.

2) Section 3.4, page 16: The third paragraph states that the PAHs listed in Table 3.4-3 will be analyzed by the CLP-RAS SOW. Several of these PAHs are not on the CLP TCL list. In addition, quantitation limits will be needed for all the non-CLP parameters to be used in this project. A SOP must be written for analyzing

these additional compounds since the CLP RAS SOW does not include them.

- 3) Section 3.4: TCLP analyses are stated in this section. However, Summary table 3.4-2 does not specify TCLP analysis. Please correct this discrepancy by adding TCLP to this table including the parameters to be tested.
- 4) Section 3.4: The first sentence should be changed to read as follows: "Arsenic and cyanide will be tested by CLP SOW Document ILM01.0. Polynuclear aromatic hydrocarbons (PAHs) will be analyzed using CLP SOW Document OLM01.1 (see comment 9 below).
- 5) Change "Phenols" in Table 3.5-2 to "Acid Extractables" as stated in Table 3.4-2. This same correction should be made throughout the QAPjP.
- 6) Change "Phenols" in Table 3.5-3 to "Acid Extractables" as stated in Table 3.4-2. This same correction should be made throughout the QAPjP.
- 7) Table 3.6-1: Several corrections need to be made in this table:
 - a) The required number of field duplicate samples for soil testing shall be revised to the Region V requirement: One field duplicate shall be collected per 10 or fewer investigative samples. Please correct this entire table to reflect this requirement.
 - b) Matrix spike/matrix spike duplicates (MS/MSD) will be collected at a frequency of one per 20 or fewer investigative samples of the same matrix. For example, if 26 groundwater samples are collected, then 2 MS/MSD samples will be collected. Please correct this entire table to reflect this requirement.
 - c) There is a typographical error in the MS/MSD column for Phase I acid extractables in soil. Please change the "6" to a "1". Also specify a sample total in the "Matrix Total" column.
- 8) Section 3.5.1.: Please provide in this section an explanation of the intended data usage for the organic vapor screening to be done in the field (see comment F4 under the Field Sampling Plan comments.

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9) The extraction procedure of the current CLP SOW (OLMO1.1), which employs one single extraction in acid media, is not appropriate for the PAH analysis. To minimize the interferences of phenols an extraction in basic media interferences of phenols, an extraction in basic media shall be done for PAH analysis. These extraction requirements shall be included in the SOP. In addition, the SOP shall include the plan for the method detection limit study to determine the method detection limits and the linear range for all PAHs.

C) Project Organization and Responsibility

Section 4.1.2.: Please specify the laboratory responsible for the soil characteristic testing.

D) Quality Assurance Objectives for Measurement Data in terms of Precision, Accuracy, Completeness, Representativeness, and Comparability

- 1) Section 5.1.1., page 3, first paragraph: The sentence pertaining to field duplicates of soil samples shall read "For soil samples, field duplicate samples will be collected at the frequency of one per ten or fewer investigative samples.".
- Section 5.1.2.: The second paragraph states that the field instruments will be calibrated periodically throughout the day. What is the frequency of the calibration check (i.e. every ten samples, etc.)? Please specify.
- 3) Please state the % completeness for all field activities as 95%.
- Section 5.1.2. should describe the QA effort in terms of precision and accuracy for all field screening and measurement to be done during Phase I and II of this project. Please provide.
- 5) Section 5.2.: The first paragraph reference to non-CLP analyses shall be changed from "Appendix A" to "Appendix B".

E) Sampling Procedures

1) Section 6.4.: The definition of field blanks is incorrect. It needs to be stated that a field blank is prepared by collecting the organic free water in a jar

after it has been poured over previously decontaminated sampling equipment.

- 2) Section 6.6, page 4: The following information needs to be explained in this section:
 - a) Who is supplying the sample bottles?
 - b) We require that bottle blanks be prepared and tested for all bottles used in the sampling process. Please provide the procedures which will be used to ensure that all bottle types meet EPA specifications. NOTE: This will require that a sample numbering system for bottle blanks be established.
- 3) Section 6.6, page 4: The sentence states "For inorganic wet chemistry and some soil cations, the laboratory provides an in-house quality control check on 1% of all of these bottles.". Please describe in this section what is done for these quality control checks.
- 4) Table 6.6-1 needs to be revised as follows:
 - a) Total Suspended Solids (TSS) appears twice. delete the second entry.
 - b) Change the holding time for BNAs from "7 days to extraction" to "5 days to extraction".
 - c) Change the holding time for cyanide from "14 days" to "12 days".
 - d) Change the holding time for Mercury from "28 days" to "26 days".
 - e) Change the minimum volume for cyanide from "1/2 gallon" to "one liter".
 - f) Change the minimum volume for metals from "500 ml" to "one liter".
 - g) Change the holding time for VOCs from "14 days" to "10 days".
 - h) Change the holding time for pesticide/PCBs from "7 days to extraction" to "5 days to extraction".
 - i) Please add the holding time, container, and minimum volume requirements for PAHs (soil and water).
 - j) Please add the holding time, container, and minimum

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volume requirements for soil analysis (TCLP, TOC, Flash point, etc). For TCLP, the holding time includes the extraction and the analysis of the extract, respectively.

F) Sample Custody

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Section 7.2.: The field sampling process is not complete. Please provide stepwise detail for the collection of the sample containers as well as the placement of these containers in the sample cooler (i.e. the samples are placed in a cooler containing ice).

G) Calibration Procedures and Frequency

- 1) Section 8.2.: Please address or reference the appropriate SOP for laboratory instrument calibration procedures and frequency of calibration checks for all non-CLP analyses of soil and water.
- 2) Please provide the calibration procedures and frequencies for all field instruments involved in field screening and measurement.

H) Analytical Procedures

- 1) Please provide the following SOPs:
 - a) TCLP (including the extraction procedure and analytical procedures for analyzing the different parameters).
 - b) Analysis of PAHs (soil and water): Included in these SOPs should be the linear range of the method as well as the method detection limits for all PAHs to be quantitated.
 - c) Total Organic Carbon
 - d) Flash point
 - e) All ASTM methods to be used for soil classification in this project (see Table 9.3-1).

U.S. EPA reserves the right to comment further on these SOPs.

I) Internal OC Checks

- 1) Section 10.2: For the non-CLP internal QC checks, add specific references to the laboratory SOPs in Appendix B in which these QC checks are detailed.
- 2) Section 10.3: The description of internal QC checks for field equipment should include continuing calibration checks which shall be stated in this section or referenced to the field SOPs.

J) Performance and System Audits

- 1) Section 12.1.1.: The external laboratory audit responsibility for a PRP-lead project belongs to the U.S. EPA Region V Central Regional Laboratory (CRL) for all CLP and non-CLP analyses. Please delete the reference to EMSL-LV and replace it with the CRL.
- 2) Section 12.2.2.: Provide details of the criteria which will be used when performing field audits. For example, provide checklists of the items which will be examined during these audits.

K) Corrective Action

Please specify all individuals responsible for initiation, development, approval and implementation of the corrective action process in the field.

L) OA Reports to Management

Please state the frequency of the QA reports (monthly, biweekly, etc.).

II. FIELD SAMPLING PLAN

- A) The following general comments refer to both Phase I and Phase II investigation activities:
 - 1) Throughout the Field Sampling Plan, the term "Phenols" is being used (see comment B4 below for an example) to describe the analysis of these compounds by the CLP organic SOW (Document OLM01.0). Please change all "Phenol" references to "Acid extractables".

- 2) There are many statements in this sampling plan which specify the analysis of all TCL parameters (see comment B1 below for an example). The additional PAHs specified in Table 3.4-3 should be included in the background samples analysis. Please clarify in all TCL references when the additional PAHs listed in Table 3.4-3 will be analyzed.
- 3) There are several statements in this sampling plan which specify the analysis of PAHs (see comment B6 below for an example). Does this mean that TCL parameters AND the additional PAHs will be analyzed? Please clarify in all PAH references when the additional PAHs listed in Table 3.4-3 will be analyzed.

B) Phase I Investigation Activities

- 1) Section 3.1.1.: This paragraph states that the five background soil samples will be analyzed for all TAL and TCL parameters. Table 3.1-1 specifies only one sample will be tested for all TAL and TCL parameters. Please reconcile this discrepancy to show that all five background samples will be analyzed for all TCL/TAL parameters.
- 2) Section 3.2.1.: This section states that the 6 surficial soil samples will be analyzed for all TCL/TAL parameters EXCEPT VOCs. Table 3.1-1 specifies that volatiles will be tested. Correct this table by specifying in a footnote all the analyses to be performed on the surficial soils.
- 3) Section 3.1.4., page 3-8: It states that 25 soil samples will be collected. However, there are only 22 trenches shown in Figure 3.3-1. Please reconcile this by adding the additional trenches to the figure or correcting this paragraph to specify the exact number of samples to be taken.
- 4) Section 3.1.4., page 3-8: A sentence states that "Selected samples will be analyzed for phenols, cyanide, and arsenic.". Please state the selection criteria for selecting certain samples for these analyses. For example, the samples are being selected at random or they are being selected to define a plume of contamination. Please address.
- 5) Section 3.5.1.: The paragraph states "The proposed locations of the pilot borings are shown in Figure 3.5-1.". There are no pilot borings in this figure.

Please correct this figure to specify the locations of the pilot borings.

- 6) Section 3.6.1., last sentence: Please correct the sentence to read "If visual contamination is observed the soil samples will be analyzed for PAHs and BETX.
- 7) Section 3.6.3.2., first sentence: Please correct the sentence to read "If visually contaminated soils are encountered, soil samples from the pilot borings will be collected for laboratory analysis.".
- 8) Section 3.6.4.2.: Please correct the sentence from "Soil samples may be analyzed for..." to "Soil samples chosen for analysis will be analyzed for...".
- 9) Section 3.9.2.: Please provide an example of a groundwater sample number to be used in the project.
- 10) Section 3.9.2.: Please provide a sample numbering scheme for the trip blanks to be used in this project.
- 11) Table 3.1-1:
 - a) For soil testing, this table states that 9 samples will receive complete TCL/TAL analysis. Table 3.4-2 in the QAPjP states that 13 samples will receive complete TCL/TAL analysis. Please correct the appropriate table.
 - b) In the footnote, delete "phenols" as they are part of the semivolatiles mentioned previously.
- C) Phase II Investigation Activities
 - 1) Section 4.2.1. last paragraph: The sentence states "Not all samples will be analyzed for all parameters.". Please state the rationale and criteria for selecting certain samples for only certain analyses. Please address.
 - 2) Section 4.2.4.2., last paragraph: The sentence states that "Selected soil samples will be analyzed for metals and cyanide.". Table 4.1-1 specifies only arsenic and cyanide to be analyzed for these samples. Will the samples be analyzed for all TAL metals or just for arsenic and cyanide? Please correct the text or table as it applies to these samples.

- 3) Section 4.5.1., last sentence: See comment 1 of this section B (Phase II Investigation Activities).
- 4) Section 4.5.3.: This paragraph suggests that there will be two sampling rounds for groundwater during the phase II activities. More information shall be presented regarding this secondary sampling process. For example, the rationale of this secondary sampling event needs to be stated. All wells that will be sampled during this second round of sampling need to be outlined as well. Please provide this information.
- 5) Section 4.5.5.2.: The sentence states the groundwater samples will be analyzed for volatiles and semivolatiles. This sentence should be corrected to read "Groundwater samples will be analyzed for PAHs, BETX, and Phenols." (as specified in Table 4.1-1).
- 6) Table 4.1-1: This table specifies 22 groundwater samples will be tested for phenois. Table 3.4-2 of the QAPjP specifies 26 samples will be tested for phenois. Please correct the appropriate table.
- 7) Table 4.1-1: Footnote 4 states that certain samples will be tested for "low level PAHs". Please specify the following:
 - a) the low level detection limits,
 - b) number of samples to be collected for this analysis,
 - c) the rationale and criteria for selection of these samples.

D) Attachments

- 1) Attachment 1 (SOP for soil sample collection): This SOP should describe the entire sampling process. There is no information specifying the sampling equipment to be used for sample collection. Please provide this information such that this SOP will be a stand alone operating procedure for the collection of soil samples.
- 2) Attachment 2 (SOP for Chain of Custody): The only information presented in this SOP is the information to be filled out on the chain of custody form. A chain of custody outlines the specific procedures that will be used during the project to ensure that the samples are recorded and tracked from the field to the laboratory. Please provide the chain of custody procedures which

will be used in the field. This description should contain (in stepwise fashion) the procedures for sample collection to shipping. In addition, please provide the stepwise procedures for the laboratory chain of custody (from sample receipt through sample disposal).

- 3) Attachment 3 (SOP for Sample Transporting): The last sentence of the first paragraph should state that the samples will be delivered to the laboratory on the same day as sampling. Please correct.
- 4) Attachment 4 (SOP for Field Analysis Techniques): What is the purpose of the Headspace Organic Vapor Test? If this test is being used for other than health and safety purposes, a complete SOP (i.e. three point calibration standards, calibration check standards, etc.) per the U.S. EPA Region V QAS SOP guidelines will be required.
- 5) Attachment 5a (SOP for Calibration and Operation of the pH Meter): Please describe how often (i.e. every ten samples, etc.) the pH meter will be checked to ensure it is functioning properly. Please provide this procedure (including accuracy and precision requirements to be met).
- 6) Attachment 5b (SOP for Calibration and Operation of the Conductivity Meter): Please provide the concentration and composition of the conductivity standard to be used to calibrate the instrument.
- 7) Attachment 8 (SOP for Groundwater Sample Collection):
 - a) see comment Cl above.
 - b) see comment El of the Quality Assurance Project Plan comments.

III. STANDARD OPERATING PROCEDURES

1) All of the SOPs submitted are too generic in nature. These SOPs must be specific to the project. The SOPs offer several options of analysis depending on the concentration of the analyte. Specify which options of the SOP will be used based upon the project specific concentration range as well as the dynamic linear range of the method. Also, these SOPs must have detailed procedures for preparing all standards to be used for a particular analysis. Please correct the deficiencies outlined below according to these guidelines.

- 2) SOP for PAHs: This SOP is not acceptable. Please use the Guidelines for Preparation of Standard Operating Procedures to address the following:
 - a) Instrument detection limits for each analyte.
 - b) Working linear range for the method.
 - c) Section 7.3: Specify the composition of the matrix spike stock solution.
 - d) Provide the extraction procedure for soil samples.
 - e) Specify the concentrations of the calibration standards to be used. We require a 5 point initial standardization.
 - f) The preparation, composition and concentration of the continuing calibration standard are missing. Please provide.
 - g) Collection, preservation, and handling requirements are missing from the SOP. Please provide.
 - h) The injection volume needs to be specified.
 - i) Section 2.1 states a final volume of 50 μL but Section 8.11 specifies 500 μL . Please reconcile.
 - j) Please state the QC precision and accuracy criteria for the surrogate spikes, continuing calibration standards, duplicates, blanks, etc. to be used in this analysis.
- 3) SOP for BETX: This SOP is too generic. Please provide more details and address the following:
 - a) Instrument detection limits for each analyte.
 - b) Working linear range for the method.
 - c) Section 7.3: Specify the composition of the matrix spike stock solution.
 - d) Provide the extraction procedure for soil samples.
 - e) Specify the concentrations of the calibration standards to be used. We require a 5 point initial standardization.
 - f) The preparation, composition and concentration of the continuing calibration standard are missing. Please provide.

- g) The injection volume needs to be specified.
- h) Please state the QC precision and accuracy criteria for the surrogate spikes, continuing calibration standards, duplicates, blanks, etc. to be used in this analysis.
- i) Delete Table 1 because it is not to be used for this project.
- j) Table 2 does not include xylene which is one of the target compounds. Please include this compound and specify its instrument detection limit.
- k) Section 3.6, page 3: 3 GC columns are specified. Please address which two columns are to be used for this analysis.

4) SOP for BOD:

- a) Instrument detection limits for each analyte.
- b) Working linear range for the method.
- c) Please state the QC precision and accuracy criteria for the surrogate spikes, continuing calibration standards, duplicates, blanks, etc. to be used in this analysis.
- d) Section 7.4: Please provide the equation to calculate the final BOD concentration.

5) SOP for COD:

- a) Instrument detection limits for each analyte.
- b) Working linear range for the method.
- c) Please state the QC precision and accuracy criteria for the surrogate spikes, continuing calibration standards, duplicates, blanks, etc. to be used in this analysis.

6) SOP for Oil and Grease:

- a) Instrument detection limits for each analyte.
- b) Please state the concentration and preparation of all standards to be used for this analysis.
- c) Please state the QC precision and accuracy criteria for the surrogate spikes, continuing calibration standards, duplicates, blanks, etc. to be used in this analysis.

-13- Herb Kelley 2567 Fairles Dr Herb Kelley 26116

Please have the RPM forward this memo to the contractor immediately. For the next revision, submit only those pages which need to be corrected. If you have any questions regarding this report, please feel free to contact Mike DeRosa, of my staff, at 353-5966.

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QUALITY ASSURANCE PROJECT PLAN (QAP)P) COMMENTS

PRC reviewed the QAPjP dated January 23, 1991, for the Waukegan Manufactured Gas and Coke Plant Site in Waukegan, Illinois, for consistency with the following documents:

- Content Requirements for Quality Assurance Project Plan (Tsai, January 1989)
- Guidelines for the Preparation of Standard Operating Procedures (SOP) for Field and Laboratory Measurements (U.S. EPA, March 16, 1989)
- Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans -- OAMS-005/80 (December 29, 1980)
- U.S. EPA Contract Laboratory Program Statement of Work for Inorganics Analysis
- U.S. EPA Contract Laboratory Program Statement of Work for Organics Analysis

PRC's comments on the QAPjP are provided below.

- 1. QAPjP Signoff Sheet: The names of the U.S. EPA Quality Assurance Officer, Ms. Valerie Jones, and the U.S EPA Region V Project Manager, Ms. Cindy Nolan, should be given on the signoff sheet. In addition, it is not clear why two lines are allotted for the U.S. EPA Project Manager.
- 2. Page 3-16, Paragraph 2: A reference should be given for the latest statements of work (SOW) for organic and inorganic Routine Analytical Service (RAS) protocols.
- 3. Page 5-3, Paragraph 2: Barr Engineering proposes collecting field duplicate (replicate) samples at a frequency of one duplicate sample per 20 investigative samples collected. However, Content Requirements for Quality Assurance Project Plan (EPA, 1989) recommends collecting field duplicate (replicate) samples at a frequency of one duplicate sample per 10 investigative samples collected.
- 4. Page 6-2, Section 6.2: A solvent such as isopropanol may be necessary to decontaminate bailers. The solvent may remove semivolatile compounds such as PAHs that can adhere to the sides of a bailer. Isopropanol may also be necessary for any other nondedicated sampling equipment that comes in contact with grossly contaminated soil or water.
- 5. Page 6-3, Paragraph 3: More information should be given concerning the methods used to collect field blank samples. It is not clear whether the field blanks described are rinsate samples or are collected by pouring organic-free water from a bottle directly into sample bottles.
- 6. Page 7-2, Paragraphs 2 and 3: The references to Figures 7.2-2 and 7.2-3 are reversed and should be corrected. Figure 7.2-2 is the sample label and Figure 7.2-3 is the custody seal.
- 7. Page 8-1, Sections 8.1 and 8.2: The calibration procedures and frequency for soil characteristic parameters (see Table 9.3-1) should be addressed in Section 8.1 (they are not included in the Contract Laboratory Program RAS) and Section 8.2 (they are not included in the standard operating procedures for laboratory analysis in Appendix B).
- 8. Page 8-1, Section 8.3: The standard operating procedures for field measurements are described in Appendix A, not Appendix B as indicated in this section. The reference should be corrected.

- 9. Page 9-1, Section 9.3, Last paragraph: The QAPjP includes soil characterization parameters in this section (Field Analysis); however, soil characterization parameters will be analyzed in the laboratory not in the field. Therefore, procedures for the parameters listed on Table 9.3-1 should be provided in Appendix B. In addition, an SOP for field screening soil samples for organic vapors should be given in Appendix A.
- 10. Table 3.3.3: The maximum concentration (58 ppm) presented for mercury is high. The text should clarify why this compound was not selected as an indicator parameter (see comment on Table 3.4.1).
- 11. Table 3.4.1: Table 3.4.1 does not contain any heavy metals; however, heavy metals such as mercury and arsenic have been found in high concentrations at the site. In addition, selenium should be included in the group of indicator chemicals. Selenium is found in relatively high natural concentrations in coal.
- 12. Table 3.4.2: Soil characteristic testing should be defined in a footnote to this table. In addition, the number of Phase II ground-water samples (26) listed in this table does not agree with the number (22) listed in Table 3.5.3. Finally, footnote 2 should state that the low-level gas chromatograph/mass spectrometer (GC/MS) method for PAH analysis is presented in Appendix B, not Appendix A.
- 13. Table 3.4.5: This table should present quantitation limits for low-level PAHs in water as well as TOC and BTU values in soil.
- 14. Table 3.5.3: Barr Engineering does not propose to sample any ground-water monitoring wells for TAL/TCL constituents during Phase II. The text should clarify why TAL/TCL constituents will be analyzed for in Phase I and not in Phase II.
- 15. Table 3.5.4: This table is incomplete. Data quality objectives should be given for the following laboratory parameters:
 - Soil -- TCL volatiles, TCL semivolatiles, TAL metals and cyanide, TCL pesticides, and phenols
 - Water -- TCL pesticides, volatiles (benzene, toluene, xylene, and ethyl benzene), and semivolatiles (PAHs and phenols)
- 16. Table 3.6.1: The following seven issues should be addressed. (1) Table 3.6.1 lists "field screening for PAHs" as a field parameter. This field parameter is not discussed in the QAPjP. (2) Table 3.6.1 should list whether metals samples will be filtered, unfiltered, or both. If both filtered and unfiltered samples will be collected for metals analysis, a separate line for each type of sample should be provided in the table. (3) The numbers of field duplicate samples are incorrect. As described above, U.S. EPA recommends that field duplicate samples be collected at a frequency of one per 10 or fewer investigative samples. (4) Many of the matrix totals for Phase I soil laboratory parameters and Phase II general chemistry parameters are incorrect. The matrix total for porosity is also incorrect. (5) Footnote 2 should indicate that extra sample volume is required only for water matrix spike and matrix spike duplicate (MS/MSD) samples. In addition, footnote 3 should indicate that extra sample volume is not required for inorganic MS/MSD samples. (6) The number of Phase II water MS/MSD analyses is incorrect; the correct number is two. 7) Field duplicate samples should be collected for determination of soil characteristics; the table does not include any field duplicate samples for determination of soil characteristics.
- 17. Figure 4.1-2: Page 4-4 states that Figure 4.1-2 presents the organizational structure of the laboratory; however, this figure appears to present a corporate structure unrelated to the organizational structure of the laboratory. This figure should show the relationships

between key individuals at the laboratory, such as the sampling coordinator, laboratory manager, and quality assurance (QA) officer.

- 18. Figure 4.5-1: This figure and Section 4 (Project Organization and Responsibility) should be made consistent. Figure 4.5-1 includes many roles, such as field investigations manager and soil sampling coordinator, that are not described in Section 4. In addition, it is inappropriate for Mary Mackey to serve as both the QA officer and the sampling and analysis coordinator. According to the fourth paragraph on page 4-3, she is responsible for specifying field sampling and sample analysis methods; however, an individual not involved in the project should serve as the QA officer, who will evaluate the adequacy of field sampling and sample analysis methods.
- Table 6.6-1: The following eight items should be addressed. (1) The table should present 19. sample containers, preservations, and holding times for low-level PAH, TCLP, TOC, flashpoint, and BTU value analyses. (2) The table should specify that amber bottles are required for semivolatile and pesticide/polychlorinated biphenyl (PCB) analyses. (3) The maximum holding time for semivolatile and PCB/pesticide analysis should indicate 5 days to extraction according to the organic SOW. (4) References to plastic containers should be changed to high-density polyethylene containers, according to the inorganic SOW. (5) The minimum volume for cyanide analysis is 1 liter, according to the inorganic SOW. (6) The organic SOW requires a maximum holding time of 10 days, not 14 days as listed in the table. (7) The inorganic SOW specifies that 0.6 gram (not 0.06 gram, as listed in the table) should be added to water samples for cyanide analysis. A footnote should also be added to indicate that ascorbic acid is required only in the presence of residual chlorine. Because Barr Engineering will not be sampling chlorinated water from residential wells, it is unlikely that ascorbic acid will be required. (8) The table provides information on sample containers, preservation, and holding times only for water samples. The table should provide this information for soil samples as well.
- 20. Table 9.3.1: Barr Engineering proposes to use U.S. EPA Method 9060 in SW-846 to analyze soil samples for TOC. However, Method 9060 applies only to liquid samples. The text should clarify whether Barr Engineering intends to modify this method for soil analysis. Barr Engineering should either present the modifications to Method 9060 or propose an alternate analytical method for analyzing soil samples for TOC. In addition, the table should provide a reference for the TCLP extraction method.
- 21. Appendix A: The SOP for calibrating and operating the pH meter should discuss (1) the model of instrument that Barr Engineering will use to measure pH and (2) the procedure and quantity of field replicates. In addition, most pH meters are capable of measuring the pH of a sample to the nearest hundredth of a pH unit. It is not clear why Barr Engineering proposes to measure the pH of a sample to the nearest tenth of a pH unit.
- 22. Appendix A: Barr Engineering proposes to calibrate the specific conductivity meter on a weekly basis. PRC recommends that the meter be calibrated on a daily basis. In addition, the frequency for calibrating the pH meter should be given.
- 23. Appendix A: The SOP for filtering ground-water samples refers to a "Figure 1." This figure is not provided in the SOP. This SOP should also discuss the procedure for decontaminating the filter apparatus between samples.
- 24. Appendix B: Sample preservation methods should be provided in the SOPs.

HEALTH AND SAFETY PLAN COMMENTS

North Shore Gas Company has generally prepared the health and safety plan in accordance with 29 CFR 1910 Occupational Safety and Health Act (OSHA) regulations and methodologies. However, PRC's review generated the following general and specific comments.

General Comments

The chemical hazards section should be placed in an appendix.

A standard form of presentation such as Material Safety Data Sheets (MSDS) should be used to identify chemical hazards.

References and proper text citations should be provided for the information used to prepare this health and safety plan.

The health and safety plan should describe Level B personal protection equipment (PPE) and should provide complete information about Level A.

The health and safety plan should identify the various contamination zones in the work area at the site.

The health and safety plan should specify PPE levels under which workers will perform their activities and conditions that require workers to upgrade to another level.

Specific Comments

- 1. Paragraph C: The text should clarify whether all staff members participating in field activities have health and safety clearance.
- 2. Page 6, Paragraph 2: References and text citations should be provided for this section.
- 3. Page 6, Paragraph 3: The text should clarify the difference between skin absorption and skin and eye contact.
- 4. Page 6, Paragraph 3: References and text citations should be provided for this section.
- 5. Page 7, Paragraph 3: Unique information about the physical properties and chemical hazardous should be prepared for each site contaminant using MSDSs or an equivalent system.
- 6. Page 7, Paragraph 4: OVA (organic vapor analyzer) should be spelled out.
- 7. Page 8, Paragraph 2: The statement that both arsenic and cyanide are highly toxic agents in the body should be clarified.
- 8. Page 10, Table 1: The source(s) of the information provided in the table should be specified.
- 9. Pages 12 and 13, Tables 2 and 3: An explanation should be provided for division of Levels D and C into sublevels.
- 10. Page 17, Paragraph 5: The health and safety plan should include comprehensive decontamination procedures for all levels to be placed in an appendix.